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Care of Mildly Ill Children Enrolled in Day-care Centers

Management by Parents and by Trained Home Workers

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Because child day-care regulations exclude ill children, parents are frequently faced with problems in finding an alternative care arrangement. This pilot study compares home care of mildly ill children by parents (46 preschool children) with care by trained home workers (23 preschool children) during 20 weeks in 1977. Episodes of illness in children cared for by trained home workers showed a slightly shorter duration (median 3.0 days, range 2 to 11 days versus median 5.2 days, range 2 to 14 days) and a less severe course (fewer and milder signs of illness) when compared with episodes of illness in children cared for by parents. Other selected activities involved in the management of the mildly ill children were comparable. Although larger studies are needed, it appears that if parents desire an alternative care arrangement for their children during mild illness, care by a trained home worker may be convenient and safe.

CHILD DAY-CARE REGULATIONS in several states require that centers exclude sick children even when they have minor illnesses.[1] Because several studies have reported that young children enrolled in day-care may have more illnesses than their counterparts cared for at home,[2,3] this policy presents a frequent problem to the children's families. The most available type of care arrangement is, of course, for a parent of the sick child to stay home and care for the child (A. Chang and P. Armstrong, unpublished data, 1977). Although theoretically this might be the choice of most parents, many would like or need acceptable alternative types of care arrangements because they cannot stay at home.

What are some of these alternative care arrangements? One arrangement is care at a sick bay in the day-care center itself. Although Loda and his associates have shown that this is feasible and safe, most day-care centers have neither the space nor the staff to provide this service (oral communication, Berkeley Sick Child Care Project, 1108 F San Pablo, Albany, CA 94706). Another possible care arrangement involves the establish-

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ment of a separate health center or day-care infirmary that would provide care for the mildly ill children. Such a facility could be set up in a public health agency or in an unused area of a hospital. The authors doubt that such a facility would be readily promoted, however, and we are not aware of the existence of any such centers. A third type of care arrangement is for the child to be cared for at home by an older sibling or other relative, a neighbor, a babysitter or a trained home worker. The Berkeley Sick Child Care Project provides such an arrangement. Using a dial-and-dispatch system it sends, on parental request, a trained home worker to an ill child's own home.[4] These home workers (whose training will be described later) care for the children for part or all of the day during minor illnesses.

In an earlier study of health service needs in day-care centers in Berkeley, California, this type of sick care was designated as the first choice of center directors or health coordinators.[5] Although a preliminary report has described the organization and costs ($3 per hour of care) of such a system, little is known about the actual course and management of the episodes of illness.[6] Our pilot study compares care by parents with care by trained home workers in a sample of preschool children attending a large day-care center in Albany, a small community neighboring Berkeley, which had access to the trained home workers after all the Berkeley requests for care had been met. Comparisons were made of the (1) average duration of illness, (2) presence of certain signs of illness, (3) severity of the signs of illness and (4) medical procedures usually carried out (such as a visit to a physician, temperature recording and administration of medication). Our hypothesis was that the illness episodes of children cared for by the trained home workers would show no differences from those of children cared for by parents in the categories listed above.

Methods

Episodes of mild illness occurring in 69 preschool children enrolled in the Albany Children's Center were monitored during 20 weeks, from January 10, 1977 to May 27, 1977. The monitoring was carried out by an experienced public health nurse who had worked with preschool children in a Head Start project.

Children having episodes of minor illness were recruited into the study sample in the following manner: Each weekday morning the dispatcher at the Berkeley Sick Child Care Project informed the study's public health nurse of any ill child enrolled in the center who would be cared for by a trained home worker in the child's own home. These illness episodes were called the *trained worker care* cases. It should be noted that only those children who were experiencing the first day of illness were recruited into the study. The nurse would then randomly select one or two absent children from the center who were also having their first day of illness but who were being cared for at home by parents. These illness episodes were called the *parent care* cases. In many cases, however, the children actually received both types of care: trained worker care cases were cared for by parents during evenings and nights, on weekends and on holidays; and at times parent care cases were assigned, at some point during the illness, to trained home workers. Thus, the terms parent care cases and trained worker care cases are relative and refer to those illness episodes in which more than half of the days of the illness episode were handled by one of the two types of care arrangement.

A short description of the trained workers is appropriate. The typical home worker was a mature woman who had been a longtime resident of the community and who had some experience in child care either as a parent or as a babysitter. Before working in the Sick Child Care Project, these workers received five weekly two-hour training sessions on first aid, emergency care and care of mildly ill children. The instructors were a nurse and the Berkeley project coordinator, who was an experienced social worker. Following these training sessions, the entire group of eight workers met on a regular monthly basis to discuss common topics of interest and questions that arose during their work with mildly ill children.

The typical routine of the trained worker was as follows: When the worker first arrived at the ill child's home, she obtained some basic information from parents such as signs and symptoms of illness, instruction for care and any special instructions for administration of medications, the work telephone number of the parent or parents and the telephone number of the child's doctor. In addition, the worker completed a daily report decribing her activities with the child, medicines administered and any problems that arose. At the end of the illness episode parents were also asked to

complete a worker evaluation report describing their appraisal of the home worker. These reports were usually very positive and favorable.

To monitor the illness episodes, it was necessary to develop a practical illness inventory that would serve as a study instrument. Following the example used by Lakin and her associates.[7] a simple inventory consisting of ten common signs of childhood illness was developed. These were divided into five minor and five major signs, and two degrees of severity, mild and moderate for each sign. The inventory was developed from discussions with both child care workers and parents. The signs labeled as major were those that parents showed the most concern about or that they perceived as being major signs of illness. The minor signs were those that parents felt could be cared for in a group setting, at least in the mild range of seriousness. These opinions and attitudes of parents were obtained in a survey that was conducted concurrently (A. Chang and P. Armstrong, unpublished data, 1977).

The inventory of signs of illness and the two degrees of severity for each sign were arranged as follows: *Minor signs* included (1) cough (coughing occasionally, less often than every ten minutes; coughing frequently, more often than every ten minutes); (2) eye problems (eyes slightly red without exudate; moderately red and/or with exudate); (3) general appearance of fatigue (tired; very tired or listless); (4) reduced activity (half or more of usual activity; less than half of usual activity), and (5) reduced appetite (half or more of usual food intake; less than half of usual intake). The *major signs* included (1) increased temperature (37.7° to 38.8°C [100° to 101.9°F]; 38.9°C [102°F] or above); (2) vomiting (once a day; twice or more a day); (3) diarrhea (one or two loose stools a day; three or more loose stools a day); (4) abnormal breathing (faster than normal—more than 40 breaths per minute, and/or with more effort; breathing noisily, with wheezing or other sounds from the chest), and (5) rhinitis (nose running occasionally, less than every hour, and/or stuffy; running frequently, every hour or more).

During the study, the nurse continued daily monitoring of the episodes of illness until the child became free of any mild major signs of illness and free of any moderate minor signs of illness. This end point was agreed on because it was at that point that the day-care center staff would agree to receive the child back. Each day the nurse would visit the sick child and observe him or her for about ten minutes, recording signs of illness and their severity. Monitoring of illness during weekends and holidays was done by parents using a simple checklist. Parents received written as well as oral instructions for use of this checklist. If a parent forgot to complete the questionnaire, the nurse would call on the following Monday or day after the holiday and ask about the course of illness during the weekend or holidays.

The signs of illness were recorded on an illness episode form, which contained the following information: (1) name of child, (2) illness episode code number, (3) type of care arrangement, (4) age of child, (5) tentative diagnosis, (6) date illness began, (7) date illness ended, (8) duration of illness (in days), (9) ten signs of illness and severity of each sign for each day of illness, (10) visit to doctor, (11) medicine administered, (12) temperature recorded and (13) other medical procedures carried out (such as sponging for fever or forcing of fluids).

During the study each of the two pediatrician-authors made unannounced visits to the sick children to verify the reliability of the nurse's observations. During the 20 weeks 14 paired illness recordings were made which showed a 90 percent agreement between observations made by one of the pediatricians and the study nurse.

Results

In all, 69 preschool children were involved in this study: 46 received parent care (4 were 2 years old, 29 were 3 years old, 11 were 4 years old and 2 were 5 years old) and 23 received trained worker care (5 were 2 years old, 6 were 3 years old, 10 were 4 years old and 2 were 5 years old). There were proportionately more children 3 years of age in the parent care group and fewer that were 4 years of age when compared with the trained worker care children.

A total of 95 separate illness episodes were monitored, 26 trained worker care cases and 69 parent care cases. The small number of cases in each group was due to the fact that on some days no trained home workers were available for the Albany center children because they had been assigned to Berkeley children. In most of the episodes under either type of care, the weekend and holiday monitoring was carried out by the pediatric nurse by telephone.

Table 1 shows that the median durations (in days) of the illness episodes for parent care cases

TABLE 1.—*Duration of Illness, Number of Sign Days, Number of Signs per Episode and Severity of Signs per Episode by Type of Care*

Determination	Parent Care Cases (N=69)	Trained Worker Care Cases (N=26)
	Median Days	Median Days
Duration of illness episodes	5.2*	3.0*
Illness signs per episode†	10.5*	7.0*
Major signs per episode	5.0*	2.5*
Minor signs per episode	6.0*	4.0*
Mild severity signs per episode	8.0*	5.5*
Moderate severity signs per episode	2.5	1.2

*Medians for parent care and trained worker care are significantly different, $P<0.05$ (Mann-Whitney-Wilcox in rank-order test).

†The number of signs in each day were added together to give the number of signs in the whole episode.

and for trained worker care cases were 5.2 and 3.0 days, respectively. The table also gives the median days for the following categories (numbers refer to days for parent care cases and trained worker care cases, respectively): illness signs per episode* 10.5 and 7.0; major signs per episode 5.0 and 2.5; minor signs per episode 6.0 and 4.0; mild signs per episode 8.0 and 5.5, and moderate signs per episode 2.5 and 1.2. There were statistically significant differences in five of the six comparisons above ($P<0.05$ by the Mann-Whitney-Wilcox in rank-order test).

Table 2 shows comparisons of the average number of days that a sign (of either mild or moderate severity) was present, (2) the percent of episodes where a sign (of either mild or moderate severity) was present, and (3) the percent of episodes involving a visit to a physician, administration of medicine, temperature recording and other medical procedures. There were no statistically significant differences in the above four designations.

The first and last days of each illness episode were analyzed for the total number of signs, the numbers of major and minor signs, and the numbers of mild and moderate signs in order to discern any significant differences between the two groups of cases either at the beginning or at the end of the illness episodes. No significant differences were found in any of the above categories between the 26 trained worker care cases and the 69 parent care cases.

Discussion

This pilot study, which compares the home management of mildly ill children enrolled in day-care by parents and by trained home workers, shows that the two types of care arrangements were comparable when certain measurements of illness were monitored. In fact, a number of observations per illness episode such as duration of illness, number of major signs, number of minor signs and number of mild signs indicated that the 26 illness episodes cared for mainly by trained home workers were somewhat milder and of

*The number of signs in each day were added together to give the number of signs in the whole episode.

TABLE 2.—*Comparison of Signs of Illness, Presence of Illness Signs, Management of Illness Episodes and Diagnostic Impressions*

	Parent Care Cases (N=69)	Trained Worker Care Cases (N=26)
Average number of days that sign (of either severity) was present per illness episode	Days	Days
Runny nose	4.1	2.9
Cough	2.9	1.9
Reduced activity	1.4	0.8
Reduced appetite	1.2	1.1
Appearance of fatigue	0.9	0.5
Fever	0.7	0.5
Breathing problem	0.2	0.1
Inflamed eyes	0.2	0.1
Diarrhea	0.2	0.1
Vomiting	0.1	0.1
Percent of illness episodes where sign (of either severity) was present	Percent	Percent
Runny nose	78.3	73.1
Cough	68.1	57.7
Reduced activity	63.8	61.5
Appearance of fatigue	55.1	50.0
Reduced appetite	52.2	61.5
Fever	40.6	30.8
Vomiting	14.5	7.7
Diarrhea	14.5	7.7
Breathing problem	10.1	7.7
Inflamed eyes	8.7	5.8
Percent of illness episodes with physician visit, administration of medicine, temperature recording and/or other medical procedures done	Percent	Percent
Physician visit	29.0	34.6
Administration of medicine	63.8	76.9
Temperature recorded	21.7	23.1
Other medical procedures done	17.4	11.5
Diagnostic impressions	Percent	Percent
Upper respiratory infection	66.7	53.8
Diarrhea	11.6	11.5
Fever	7.2	23.1
Otitis media	7.2	7.7
Conjunctivitis	4.3	0.0
Acute laryngitis and tracheitis	1.4	0.0
Eczema and/or dermatitis	1.4	0.0
Chronic pharyngitis and nasopharyngitis	0.0	3.8

slightly shorter duration. Activities involved in the care of both groups of children, such as visits to a physician, administration of medications, temperature recording, and other medical procedures, were comparable between the two types of care arrangements.

What possible explanations could account for the differences in the duration and severity of illness in the episodes noted above? It seems unlikely that the types of illnesses in either group could account for these differences because the presumptive diagnostic impressions were similar in type and percent distribution (Table 2). The characteristics of the first and last days of illness in the episodes monitored were also comparable. Did parents inadvertently prolong the children's stay at home? This also seems unlikely because many of the parents were either students or were employed. Presumably, these parents were interested in shortening the duration of illness as much as possible in order that they themselves could return to school or to work. Were the nurse's observations on the parent care cases unduly severe and critical? There was no evidence of this in the validation visits made by the two pediatricians in the study.

Did the trained home workers provide better care, which in turn resulted in somewhat shorter and milder illnesses? There was no evidence that the care provided by these workers was anything unusual or different from the type of care provided by parents.

Although it was shown above that the characteristics of the first day of illness were comparable in the two groups, an additional explanation could be that parents intuitively wished to provide care for their children whom they thought to be more seriously ill.

It should be emphasized that these slight differences have appeared in a pilot study that compares a relatively small number of illness episodes. Although a future study involving a larger number of illness episodes may show an advantage of one type of care over the other, such a conclusion at this time is not justified.

Nevertheless, as more young children are served in day-care programs, the need for practical alternative care arrangements for them during episodes of mild illness will become more important. Clearly, practicing physicians, especially pediatricians, will become involved with parents and day-care personnel in developing new forms of care arrangement that are safe and feasible.

This pilot study has attempted to show that when families are interested in and desire an alternative care arrangement for their mildly ill children, care by a trained home worker may be a safe and acceptable arrangement.

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